Knee Surg Sports Traumatol Arthrosc
(2005) 13: 335–337

SPORTS MEDICINE

DOI 10.1007/s00167-004-0532-6

Roland M. Biedert

# Surgical treatment for persistent complaints following rupture of the fascia of the plantaris longus muscle: a case report

Received: 26 January 2004
Accepted: 2 March 2004
Published online: 16 October 2004


**Abstract** We report an unusual injury of the plantaris longus muscle with failed conservative treatment but successful surgical intervention. A simple surgical technique offers a minimally-invasive solution for treating persistent complaints.

**Keywords** Plantaris longus muscle · MRI · Treatment · Surgery

R. M. Biedert
Institute of Sport Sciences,
Orthopaedics and Sport Traumatology,
2532 Magglingen, Switzerland
E-mail: roland.biedert@baspo.admin.ch
Tel.: +41-32-3276490
Fax: +41-32-3276405

## Introduction

Isolated ruptures of the plantaris longus muscle are, in contrast to ''tennis leg'', a tear of the medial head of the gastrocnemius muscle, extremely rare. Allard et al. [1] and Helms et al. [6] described plantaris muscle ruptures using MRI documentation. The patients' symptoms resolved with non-surgical treatment over a period varying between 10 days and a few weeks. Only Hamilton et al. [4] documented surgically a complete rupture of the plantaris muscle at its musculotendinous junction. Indications for proximal-medial surgical revision were the persistence of patients' symptoms and the potential for an underlying neoplasm. Activities at the preinjury level were possible in these cases 1 month after surgery.

## Case report

A 32-year-old top-level professional soccer player was seen 6 weeks after the initial injury. He felt a sharp pain in his proximal right calf during acceleration in training.

There was little hemorrhage and only minimal painful swelling in the posteromedial portion of the calf between the medial head of the gastrocnemius and the soleus muscle. All functions of ankle and knee joint were normal. But persisting pain and cramping were constantly noted after some minutes of running, forcing the athlete to stop the training.

MRI examinations performed 7 and 28 days after injury revealed a rupture of the fascia of the plantaris longus muscle (13 cm in length) between the gastrocnemius and soleus muscle (Figs. 1 and 2). High signal intensity suggested on T2-weighted images a persisting hematoma and edema process. Normal signal intensity was found in the gastrocnemius and soleus muscles, documenting evidence of focal tearing of the plantaris longus muscle.

Physical therapy (massage, stretching, strengthening, electrotherapy), rest and anti-inflammatory medication did not resolve the complaints within 6 weeks. No

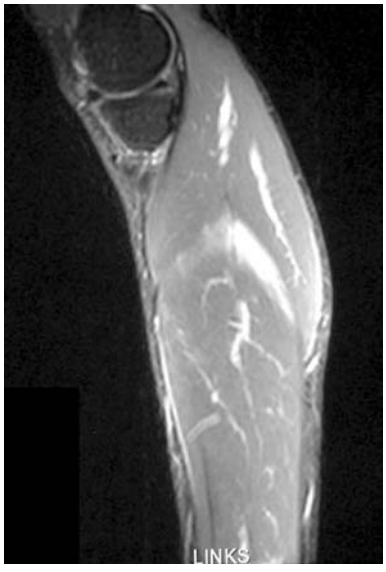


**Fig. 1** Sagittal MR shows partially-retracted plantaris longus muscle and tendon with fluid around the muscle belly and more distal

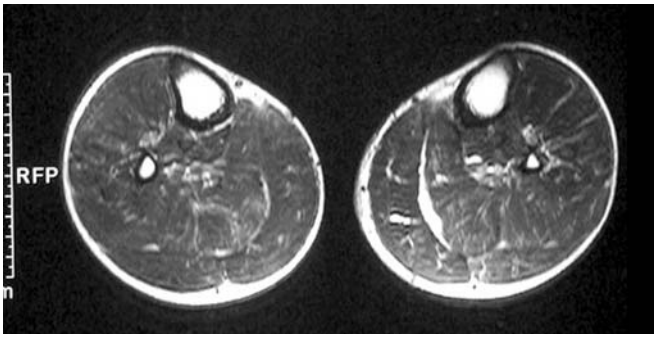


**Fig. 2** Axial MR through the calf documents hemorrhage between uninjured lateral and medial head of the gastrocnemius muscle and the soleus muscle

improvement in the healing progress was noted and the long-term clinical outcome was unclear. Therefore the decision had to be taken to perform a minimal surgical intervention. Surgery consisted of a distal tenotomy of the plantaris longus tendon using a 1 cm medial incision under local anesthesia (Fig. 3). The intention of this surgical technique was to eliminate the tension on the muscle fascia and the belly. The postoperative treatment included immediate full weight-bearing and non-restricted sport activities after 2 weeks (Fig. 4). The preinjury performance level was completely regained 20 days after surgery.

## Discussion

The plantaris longus muscle runs from the medial aspect of the calcaneus, parallel to the Achilles tendon, on the

**Fig. 3** Surgical preparation of the plantaris longus tendon with subsequent tenotomy

**Fig. 4** Full weight-bearing 7 days after surgery

soleus muscle to proximal with an attachment medial to the lateral head of the gastrocnemius muscle at the posterior area of the femur [9]. It functions as an accessory plantar-flexion muscle of the calf [1]. In contrast to the gastrocnemius and soleus muscles, it runs in a diagonal direction and spans three joints: knee, upper ankle, and talocalcaneal [1]. This could explain the isolated injury during dorsiflexion of the ankle in combination with external rotation of foot and ankle and the forced movement from knee flexion into extension

during acceleration. We suggest that such a high and sudden eccentric load may cause this isolated type of injury.

In contrast to the surgically-documented complete tear of the plantaris muscle described by Hamilton et al. [4], the tension of the musculotendinous functional unit was still subtotally present in our case, and therefore the aponeurosis and muscle fascia could not heal. To interrupt this tension and to give the ruptured fascia a better chance to heal, distal tenotomy of the plantaris was chosen as minimal surgical procedure to resolve the problem. This tendon is useful for the reconstruction of the Achilles tendon [8], the peroneal retinaculum [5], or the fibular ligaments [2, 7] and may be resected without functional deficit. Our athlete also tolerated this tenotomy without any complaint.

The distal approach described offers several advantages compared to the proximal interventions reported in the literature: surgery possible using local anesthesia, immediate full weight-bearing, shorter incision, and less risk of postoperative scaring or adhesions.

Muscle injuries of the calf are normally a domain of conservative treatment. This case demonstrates a rare injury and the simple surgical technique for successful treatment after a long history with failed nonsurgical therapy in a top-level soccer player.

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